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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------------|---------------------|-------------------|
| 10/724,111 | 12/01/2003 | Yoshio Okayama | 65933-056 | 9924 |
| 20277 | 7590 | 06/29/2005 | EXAMINER | |
| | | MCDERMOTT WILL & EMERY LLP | | GURLEY, LYNNE ANN |
| | | 600 13TH STREET, N.W. | ART UNIT | PAPER NUMBER |
| | | WASHINGTON, DC 20005-3096 | | 2812 |

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|---|------------------------|---------------------|
| Advisory Action Before the Filing of an Appeal Brief | Application No. | Applicant(s) |
| | 10/724,111 | OKAYAMA ET AL. |
| | Examiner | Art Unit |
| | Lynne A. Gurley | 2812 |

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

THE REPLY FILED 13 June 2005 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- The period for reply expires 3 months from the mailing date of the final rejection.
- The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because

- They raise new issues that would require further consideration and/or search (see NOTE below);
- They raise the issue of new matter (see NOTE below);
- They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
- They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. Applicant's reply has overcome the following rejection(s): _____.

6. Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. For purposes of appeal, the proposed amendment(s): a) will not be entered, or b) will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: _____.

Claim(s) rejected: 1-18.

Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

9. The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

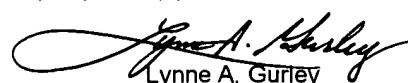
10. The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.

12. Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____

13. Other: _____


Lynne A. Gurley
Primary Patent Examiner
TC 2800, Art Unit: 2812

Continuation of 11. does NOT place the application in condition for allowance because: In response to Applicant's remarks, page 9, Lukanc's structure teaches conventional rounding/tapering of the contact opening to facilitate the deposition of interconnect metal and even though done purposefully, as is both commonly known and conventional in the art to do so. The etch is performed with sputter etching, RIE etc. as is done in Applicant's admitted prior art in the specification, and the etch also cleans the contact hole in preparation for subsequent metallization, which is conventional. It may be considered a normal tapering of the contact hole for this reason, because it is commonly performed. (See You et al. US 6,756,672, column 7, lines 5-20, lines 40-48; column 8, lines 22-26; column 15, lines 30-51; column 16, lines 13-20 for support. You also shows removal of the barrier layer at the bottom of the contact). The excess tapering is undesirable at the end of the process because it increases the line-to-line capacitance and the sensitivity to line to line shorts due to residual metal (See Stamper et al. US 6,838,355, column 12, lines 2-10; column 11, lines 55-57; Flg. 4 for support. Stamper also shows removal of the barrier layer at the bottom of the contact. Also, see Seta et al. US 6,605,542 fig. 6 for conventional etching and rounding of corners in dielectric and removal of the tapering; column 16, lines 55-60; column 17, lines 11-26). Lucanc shows the sacrificial layers used in conjunction with dielectric layers as well. The Examiner takes the position that the Lucanc and the prior art teaches that the removal of the tapered corners of the dielectric and/or sacrificial layers is desirable in the final interconnect structure, as shown by the admitted prior art, and as broadly interpreted, considering that Applicant's specification defines the problem of creating the rounded corners by etching process, with the exact structure complete with the barrier layers and conductive layers. The natural taper is caused by the conventional etching of the contact hole and/or cleaning process/sputter etching of the contact hole and, the solution of removing the taper is conventional and is addressed by the Lucanc and the admitted prior art.